



UNITED STATES PATENT AND TRADEMARK OFFICE

W  
UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
[www.uspto.gov](http://www.uspto.gov)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/643,842	08/19/2003	Roger T. Simpson	BW-DKT01115A	4915
32175	7590	05/11/2004	EXAMINER	
BORGWARNER INC. POWERTRAIN TECHNICAL CENTER 3800 AUTOMATION AVENUE, SUITE 100 AUBURN HILLS, MI 48326-1782			ESHETE, ZELALEM	
		ART UNIT	PAPER NUMBER	
		3748		

DATE MAILED: 05/11/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No.	Applicant(s)
	10/643,842	SIMPSON, ROGER T.
	Examiner Zelalem Eshete	Art Unit 3748

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) Responsive to communication(s) filed on \_\_\_\_\_.
- 2a) This action is FINAL.                    2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) Claim(s) 1-8 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) Claim(s) \_\_\_\_\_ is/are allowed.
- 6) Claim(s) 1-8 is/are rejected.
- 7) Claim(s) \_\_\_\_\_ is/are objected to.
- 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on \_\_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) All
  - b) Some \*
  - c) None of:
    1. Certified copies of the priority documents have been received.
    2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
    3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>08/19/2003</u> . | 6) <input type="checkbox"/> Other: _____  |

**DETAILED ACTION**

***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1,4-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Quinn et al. (5,184,578) in view of Berg (3,845,694).

Regarding claims 1,4: Quinn discloses a variable cam timing phaser disposed between a first moving shaft and a second moving shaft, the phaser having a first end connected to the first moving shaft and a second end connected to the second moving shaft (see figure 3); a housing connected to the first end and a rotor connected to the second end, the rotor forming at least one vane disposed within the housing and dividing the housing into an advance chamber and a retard chamber, the vane being limited by at least one physical stop caused by an inside surface of the housing (see figure 11); the phaser being coupled to at least one check valve (see numerals 84,86); the phaser being further controlled by a feed back control loop having a control law, wherein an integrator accumulates a plurality of error signals resulting from the difference between a set point control signal and a feedback signal (see figure 1); the

phaser further including a spool valve having a predetermined null position (see figure 11).

Quinn fails to disclose moving the spool valve just off the predetermined null position (either toward a retard or advance direction); permitting control fluid to flow at a substantially slow rate; and causing the vane to be positioned at a substantial distance away from the physical stops, thereby reducing noise caused by the vane coming in contact with the housing.

However, Labzelter teaches slowing end of stroke motion to reduce shocks/damage by cushioning effect through restriction of fluid discharge (see abstract).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the motion of the spool valve as taught by Quinn to that of restriction of fluid discharge as taught by Labzelter in order to avoid the shock as taught by Labzelter.

With regard to the Labzelter reference, it has been held that a prior art reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the applicant was concerned, in order to be relied upon as a basis for rejection of the claimed invention. See *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). In the instant application, the reference to Labzelter addresses substantially the same problem faced by the instant inventor, and solves such problem substantially as claimed. Moreover, the cushioning of fluid actuators is equally germane to rotary and reciprocating members.

Regarding claim 5: Quinn as modified above discloses the predetermined null position is determined by a controller (see figure 1).

Regarding claim 6: Quinn as modified above discloses using an engine control unit (see column 12, lines 36 to 39).

3. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Quinn in view of Berg as applied to claim 1 above, and further in view of Simpson et al. (6,247,434).

Quinn in view of Berg discloses the claimed invention as recited above; however, fails to disclose comprising the step of opening the loop.

However, Simpson teaches using an open loop control strategy (see column 9, lines 9 to 13).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Quinn in view of Berg's system by providing the option of open loop control strategy as taught by Simpson in order to apply the system to various control systems.

4. Claims 3,7,8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Quinn in view of Berg as applied to claim 1 above, and further in view of Gardner et al. (US2003/0033999).

Regarding claim 3: Quinn in view of Berg discloses the claimed invention as recited above; however, fails to disclose the spool valve is center mounted within the phaser.

However, Gardner teaches the spool valve is center mounted within the phaser (see figure 13). Gardner further discloses such arrangement improves the response of the phaser (see page 3, paragraph 0037).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Quinn in view of Berg's system by center mounting the spool valve within the phaser as taught by Gardner in order to improve the response of the phaser as taught by Gardner.

Regarding claim 7: Gardner discloses the variable cam timing phaser is torsional assist phaser (see title).

Regarding claim 8: Gardner discloses the variable cam timing phaser is cam torque actuated phaser, in that Gardner discloses for most engines have acceptable cam torques at idle speed to actuate a cam phaser (see page 2, paragraph 0032).

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Zelalem Eshete whose telephone number is (703) 306-4239. The examiner can normally be reached on Monday to Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas Denion can be reached on (703) 308-2623. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Zelalem Eshete  
Examiner  
Art Unit 3748

Z

*Thomas Denion*  
THOMAS DENION  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 3700